Final Report

Commercial Motor Vehicle Driver Shortage/Retention Research and Solutions

Submitted by

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EXECUTIVE SUMMARY

The modern supply chain depends on a well-functioning trucking industry. It is quite literally responsible for the last mile of the journey that nearly 70% of the products make before being available to the consumer. These past few years have demonstrated what turmoil in this vital industry can do to the socio-economic fabric of any country. The rise of eCommerce compounded with an aging industry is threatening the foundations of U.S. economy. It is, therefore, not surprising that the shortage of truckers is crippling an industry, and this deficit is directly impacting every single citizen in the United States. The shortage of workers is two-pronged issue with concerns on both the recruitment and retention sides. The retention issue is compounded by the fact that the commercial motor vehicle (CMV) driver workforce is aging at a higher rate relative to other major industries and remains a mostly male-dominated industry. These types of changes threaten the very sustainability of the trucking business. According to the American Trucking Association, over 6% of truck drivers quit the industry during the pandemic, and that had exacerbated the issues resulting in the supply chain crisis witnessed during 2022. Despite significant industry efforts to address the capacity crisis by providing financial incentives to the younger generation entering the job market to join the trucking workforce, the looming challenge has not been adequately addressed.

Objectives: The goal of this investigation was to develop solutions to reduce turnover that can be ubiquitously used across different trucking companies regardless of setups, sizes, and workforce demographics. Our research team proposed to perform two concurrently phased, empirically driven, field-based studies. Both will leverage data from the two relevant target populations: CMV drivers with history in the industry and relatively newer drivers. The former will be sampled to understand the positive and negative precursors and expectations related to their current job satisfaction and well-being. The latter will be sampled to understand what prompted them to join the industry to determine the positive attributes of the industry.

Data Analysis: In this study, 23 drivers were interviewed over the course of 3 months. Of the 23 drivers, 9 had less than 5 years of experience within the industry while the remaining 14 had 5 or more years of experience. Although studies have sampled drivers in the past, the researchers sought new data for numerous reasons. First, the positivistic approach to studies in the past has been confirmatory and prone to introduce anchoring bias among participants being interviewed. Secondly, post-pandemic perspectives were being sought to supplement the learnings from previous studies to bolster the ecological validity of the findings. Finally, the drivers with varied levels of experiences were targeted to enhance the external validity of the findings proposed below. These validities equate to the scientific merit of the work performed here wherein the data aims to be generalizable across the target populations (i.e., truck drivers) and to capture the complexities of the real-world. In collaboration with the Michigan Truck Safety Commission (MTSC) and industry partners, we recruited drivers on a voluntary and uncompensated basis to participate in these interviews. The interviews are rooted in a social constructionism approach to research that uses an interview-style with simple, open-ended questions designed to facilitate conversations without leading interviewees. The fluid and natural conversation approach of social constructionism allows for a better understanding of the world through patterns, contexts, and social interactions. While the survey data will provide useful findings, the discourse analysis will fill in the gaps to understand the reasons behind the survey data in a more robust way. A social

constructionist approach reveals the complexities, consistencies and inconsistencies in the ways people speak about their jobs. This approach was chosen so that interviews could be conducted without presumptions or biased points of view as noted above and displayed in previous studies. This was specifically accomplished by asking questions around what drivers liked and disliked about being a truck driver and the organization they work for. This approach counters the positivistic approach to data collection wherein researchers may seek to prove a phenomenon exists. That would be inappropriate for this study as the researchers did not have a null hypothesis that they were testing rather collecting exploratory data that informs scientific perspective.

Results: The analysis method used in this study is labeled as thematic. The data collected was transcribed, analyzed, and coded. The codes were generated to break the transcripts into smaller chunks and organized within themes to determine if there was a pattern emerging. This process of coding is labeled as 'open-coding' (i.e., pre-determined codes). This process was aligned with the exploratory nature of this study and improved the internal validity of the process by controlling for confounding effects resulting from researcher confirmatory bias. A number of themes noted below have been previously identified in literature as well as some new notable contributions that have not been highlighted in depth before. Perspectives of both driver groups (experienced and new) have been presented separately whenever differing perspectives were shared. The results presented are not causal; rather they are associative, and further empirical validation is needed to ascertain the predictive capacity of each theme as it relates to driver retention. Notable themes from the data include Social Connections and Mentorship Programs, Automation and Other Technological Advances, Family, Professional Development Opportunities, Physical and Mental Health, Communication Barriers, Job Demand, Organizational Culture, Financial Security, Public Outreach and Improving Diversity, and Company Support Systems/Employee Assistance Programs.

Summary and Conclusions: This study sought to discover the positive and negative factors of working in the trucking industry. This was a novel research approach unlike many other studies that simply focus on negative factors and fall prey to confirmatory bias. Through exploratory research methods, the findings represented in this report highlight the importance of understanding how certain macro (i.e., industry-wide, national, or global) problems can be addressed through standardized micro-solutions. The standardization comes from using scientific evidence to ground solutions. Most importantly, the proposed solutions are tailored to fit the different contexts to promote adoption, implementation, and corrections. The precursor-based approach is a forward-looking approach to encourage structured, planned, and meaningful engagements among drivers and leaders. It also shows not only how those engagements can lead to learnings for the management but also how they can be used to improve the morale of drivers in real-time. There remain to be more research questions that still need exploration to directly support practitioners in fostering and bolstering the long-term sustainability of this industry. Our hope is that this research provides avenues for future discovery and learning.

Recommendations: Given the findings in this report, the investigators are proposing the following tools and recommendations that can be used to improve the current issues and concerns with truck driver shortages:

- *Job Climate Survey:* This survey-style tool measures how drivers feel about the work, working environment, and the organization culture. This tool hinges on drivers trusting the organization that their responses will not be tracked back to them and influence their job standing. This is not a tool that is launched in isolation, and care must be taken to avoid any coercive responses.
- Leadership Engagement Guide: To have an effective engagement, a leader must communicate clearly and demonstrate active listening skills. This guide supports leaders by providing suggestions for what to do during field leadership engagement with drivers. Interventions of this nature have shown their effectiveness in numerous industries and occupational settings from healthcare, military, aviation, manufacturing, construction, technology, and any other corporate environment.
- Leadership Observation Scorecard: This survey is designed to be completed after an engagement to give leaders feedback on the engagement. This also is not a tool that should be used as a target score that needs to be achieved. The survey will allow leaders avenues for targeted improvement instead of receiving generic feedback that does not provide guidance on how they can be better. Additionally, it communicates to the drivers that leaders care enough to want to keep improving and learning. Finally, as one can see, the survey is anonymous which should be highlighted when sharing it with drivers to promote honest responses. A feedback survey should be collected not from one individual, but rather from a group to ensure drivers are not worried their responses will influence their job standing/evaluation.
- Recommendations for a Multimedia Recruitment and Retention Program Design: The most effective strategy for any multimedia program around improving recruitment and retention should not only leverage the knowledge and experience of drivers but also put them front and center. This approach has two big advantages. First, it will make next generation hear from people in the industry doing the work. Secondly, perhaps more importantly, it addresses the existing workforce's biggest complaint of not being involved in professional development and management practices. These approaches can reduce isolation experienced during work, increase pride, and initiate self-reinforcement among drivers about why they are in this profession to begin with. This work needs more research to discover how drivers can be incorporated into the hiring lifecycle and this study recommends it as the next step. Furthermore, the multi-media program must also focus on providing leadership training to develop the necessary skill for managers to effectively communicate the values of the organization and to connect better with truck drivers to establish a strong and friendly work environment and culture for drivers to thrive. The tools mentioned above must be part of the leadership training lesson plan.

• Other Notable Recommendations include:

Drivers noted that the qualifying age of 21 years makes many youngsters opt for an industry that is easier to enter such as healthcare, construction, etc. Therefore, creating apprenticeship programs that can attract younger drivers is highly recommended. Such programs may need to pay stipends to participants to incentivize participation. Additionally, key trucking industry stakeholders may want to work on changing the licensing requirements and regulations for truck driving licensure so that drivers can enter

the industry earlier than 21, perhaps by linking earlier licensing to apprenticeship programs.

- Technology that makes driving safer and exciting is welcomed by drivers across the experience spectrum. There was no fear from a technology that would completely eliminate the need for a human operator for trucks. Consequently, investing in technological advances is highly recommended and has been reported by truck drivers as possibly contributing to the reduction in drivers' fatigue, the increase in the excitement of driving new vehicles, and the improvement in reliability.
- Drivers noted that the presence of Employee Assistance Programs was necessary and should be prioritized within companies. This issue may become a necessary additional benefit that is added to the employment packages offered to new truck drivers.

RESEARCH TEAM: The following is the list of the research team members:

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DISCLAIMER: The opinions, findings, and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Michigan Truck Safety Commission or the Michigan Office of Highway Safety Planning. This report was prepared in cooperation with the Michigan Office of Highway Safety Planning and Michigan Truck Safety Commission.

INTRODUCTION

The modern supply chain depends on a well-functioning trucking industry. It is quite literally responsible for the last mile of the journey that nearly 70% of the products make before being available to the consumer [Costello and Suarez 2015]. These past few years have demonstrated what turmoil in this vital industry can do to the socio-economic fabric of any country [Mittal et al. 2018]. For example, the US Postal Services is having to require more overtime from existing drivers which has increased by a whopping 18% from October 2017 to September 2021. The rise of eCommerce compounded with an aging industry is threatening the foundations of the U.S. economy [BLS 2015]. It is, therefore, not surprising that the shortage of truckers is crippling an industry, and this deficit is directly impacting every single citizen in the United States. In fact, the U.S. Presidential Office released a memo with a statement acknowledging the truck driver shortage and announced a task force to combat this crisis [White House 2021].

The shortage of workers is two-pronged issue with concerns on both the recruitment and retention sides. The retention issue is compounded by the fact that the commercial motor vehicle (CMV) driver workforce is aging at a higher rate relative to other major industries and remains a mostly male-dominated industry [BLS 2019]. These types of changes threaten the very sustainability of the trucking business. According to American Trucking Association, over 6% of truck drivers quit the industry during the pandemic. This exacerbated the issues and resulted in a supply chain crisis witnessed during 2022 [ATA 2022]. Despite significant industry efforts to address the capacity crisis by providing financial incentives to the younger generation entering the job market to join the trucking workforce, the looming challenge has not been adequately addressed [NTI 2019].

In this report, the researchers have sought to leverage the existing knowledge in the body of literature along with interviewing experienced and new drivers to produce an integrated framework of solutions that do not require significant resources. The researchers have also sought to support targeted interventions and foster a positive culture of work within the organization. The recommendations in this report are based on the understanding that solutions proposed in academic studies are often agnostic of practical constraints, political landscapes, and different company sizes which make the applicability of any proposed solutions a challenge.

The goal of this investigation was to develop solutions to reduce turnover that can be ubiquitously used across different trucking companies regardless of setups, sizes, and workforce demographics.

The following report reviews literature from the trucking sector, other industries, and scientifically validated interventions that form the basis for the investigation. The quasi-experimental approach to data collection yielded various solutions that the study recommends for organizations to apply and learn from.

OVERVIEW OF TRUCKING INDUSTRY'S BATTLE WITH RETENTION

There is no shortage of studies investigating why there is truck driver shortage; so, the question has to be asked: Why does this problem still persist? ATA reports that by 2030 the industry will face a shortfall of 80,000 truck drivers [ATA 2021]. However, this is not a new crisis. In fact, the aforementioned data on impacts of the pandemic in 2020 simply exacerbated what had been a two decade-long problem that has been progressively getting worse. Lack of women and minorities in the industry has been documented abundantly [Costello and Suarez 2015; Min and Lambert 2002]. Surprisingly, we are seeking to address a problem that has had researchers investigating at least since 1989 [LeMay and Taylor 1989]. Finally, this issue is not restricted to a continent or culture; rather it is a problem observed across Germany, Japan, Brazil, England, and India [Mittal et al. 2018].

Studies have found root-causes to high turnover and proposed practically infeasible solutions. Broad themes have been identified as key hurdles to driver shortage such as socio-economic, legal, regulatory, and psychological antecedents. It has been noted that not only is the trucking industry fraught with safety concerns for its employees, but also the work environment has been found to inflict many physical and psychological strains on them, making it a uniquely challenging work environment [Apostolopoulos et al. 2014]. Issues such as pay equity, time away from home, loneliness, isolation, and physical toll (among others) have been well-documented as root causes to high turnover. However, the solutions proposed in literature have tried to create a one-size fits all approach to address work conditions that cannot be altered. They have required resources from companies that they cannot afford. These solutions have also tackled political and social challenges (e.g., enticing next generation in a blue-collar job, addressing societal perceptions of truck drivers, and improving diversity) which are noble long-term goals, but they do not address short-term critical needs [Taylor et al. 2010].

Pay-based interventions are ineffective <u>in isolation</u>. It is undeniable that financial security drives career-related decisions of most adults. Having a pay structure and benefits that equate with the perceived and actual efforts exerted by employees is key to their motivation and well-being. Therefore, the trucking industry as a whole has sought to use financial incentives to hire and keep drivers, but the ineffectiveness of using just financial incentives (e.g., wage and bonus packages) within the industry is also corroborated by statistical trends and experience of professionals in other skilled-labor driven industries facing similar manpower shortages [Karimi et al. 2018; Liu et al. 2017; Minooei 2018]. Within these other sectors (e.g., construction, healthcare, and manufacturing), industry professionals and academics have started to explore factors beyond financial incentives to better understand the needs of their existing workforce and the expectations of the next generation in order to develop strategies that are effective in enticing individuals to join and stay in the workforce [Brunetto 2013; Welfare et al. 2019].

This approach to focus only on financial incentives ignores the reality of changing mentalities and work-life goals of generations entering the market. Most recruitment strategies have to be designed to engage younger generations, especially millennials, who will represent approximately half of the global workforce by 2020 [Pew Research Center 2018]. For example, within the construction industry, programs such as Build Your Future (http://www.byf.org/) and Go Build Alabama (http://gobuildalabama.com/) are aiming to shift the negative perceptions of students in secondary schools about careers in construction by focusing on aforementioned factors that scope beyond

monetary values. A study by Deloitte in 2016 found that millennials prioritize several factors alongside financial benefits such as work-life balance, opportunities to lead, security, and flexible working conditions [Buckley et al. 2016]. However, such professional reports provide information that is ambiguous which does not always translate into actionable interventions. Furthermore, the assertions presented in them have not been empirically validated for the trucking industry. This key demographic has not been studied and this study aims to speak with drivers entering the industry on their experiences, perceptions, choices to understand why they entered the industry and (equally important) why they choose to stay.

Some key indicators of employee retention have not been sufficiently studied and acknowledged in the trucking industry's academic literature; these include generational issues, infrastructure conditions, flexible working arrangements, and co-workers' training and development [Shakeel and But 2015]. Another key issue that is rarely talked about is organizational culture which is a significant predictor of employee retention [Sheridan 1992]. Although there are many competing definitions on what culture is, our epistemology grounds ourselves in the definition, "it is the shared value system" that drives the strategic decision-making of all stakeholders in an organization [Schneider et al. 2016]. A thriving and flexible culture impacts retention positively (directly or indirectly) through employee commitment, motivation, satisfaction, and empowerment [Deery and Shaw 1999]. Despite these key findings, there have been almost no empirically validated investigations on measuring the organizational culture, as a whole, within different trucking organizations. A few studies have investigated "safety culture" (e.g., Nævestad et al. 2020) but the research objectives of those studies were not retention focused. Therefore, generalizing trends and findings from those studies to this context would philosophically and statistically be invalid. While there are a number of societal and environmental challenges, organizations cannot address in a silo its caproate culture it can and should.

Finally, for a long time this sector has been unable to recruit and retain individuals from outside the core existing demographic. While there are obvious long-term benefits to diversity and equity in workplace, the key business value aspect is the fact that the industry is unable to entice a significant section of the population. This again relates to culture-related issues because the reputation of the industry is unable to break many pre-existing founded and unfounded biases. Addressing these gaps (i.e., ignored antecedents that turnover) in the shared body of knowledge are crucial in bolstering the long-term sustainability of this critical industry. Academics and practitioners have been myopically focused only on the financial aspect of the job, which is important but not the only criteria. Thus, the research objectives shared below aim to investigate the retention issue and develop deliverables for organizations that are practical and build upon the shared learnings to support the industry as a whole.

RESEARCH OBJECTIVES AND METHODOLOGY

To address the aforementioned gaps in knowledge, our research group proposed to perform two concurrently phased empirically driven field-based studies. Both will leverage data from the two relevant target populations; that is, CMV drivers with history in the industry and relatively newer drivers. The former will be sampled to understand the positive and negative precursors to their current job satisfaction and well-being expectations. The latter will be sampled to understand what prompted them to join the industry to determine the positive attributes of the industry.

Given that the data will be primarily collected from Michigan and surrounding areas, these questions were highly geared towards addressing local yet critical challenges. The findings will also provide impetus and foundation to study these questions on a broader scale to capture national implications. These factors will be used to determine specific yet feasible changes to the working conditions and management strategies to reduce the turnover rates. Furthermore, findings from this study will also be used to develop a new outreach program to engage existing workers in being stakeholders in addressing the retention issue within the industry. Specifically, this study aimed to answer the following essential questions through rigorous experimentation:

- 1. What are the prevailing strategies that have been tested in the academic literature and across similar industries to support retention and recruitment efforts?
- **2.** What work-related, social, and psychological factors influence the job satisfaction and well-being perceptions among experienced and recently hired CMV drivers?

The findings of this study seek to produce leading, not lagging, tools to combat the issue of turnover. In other words, providing organizations with proactive tools to understand changes within the perspectives and well-being of the workforce can allow the management to intervene in a targeted manner. Resources within any organization are not unlimited and leadership needs to know the "why" and "how" behind investments. This study aims to produce tools that aim to take the 'guesswork' out of where management may invest to better support their workforce. This is possible by leveraging a scientifically validated technique called *precursor analysis*.

The National Academy of Engineering (2004) has defined precursors as reasonably detectable events, conditions, or actions that serves as warning signs to a fatal or disabling injury. This approach has been used across different industries including aviation, nuclear energy, and aeronautical industries to prevent accidents like Three-mile Island and Apollo 13 [National Academy of Engineering 2004, Minarick 1990]. Aviation precursors included human error, noncompliance, high-risk taking actions, and disregard or inadequate management procedures [Wiegmann and Shappell 2001]. On the face of it, the precursor approach may not seem to align with addressing the issue of truck drivers' recruitment and retention. However, the recommendations of this study are rooted in discovering "reasonably detectable" root causes to poor job satisfaction (such as physical and mental health, and an unsatisfactory working environment) that serve as warning signs to high turnover or reluctance to join the industry. By taking an approach rooted in scientific evidence, this study proposes solutions that are low-cost effective strategies to discover unique root causes within individual organizations to employee well-being (see Figure 1).



Figure 3: Precursor-Based Approach

In our efforts to tackle these longstanding problems on a macro-scale, we often encounter resistance that requires legislative intervention or overcoming significant inertia within organizations across the board. The precursor approach aims to focus on a micro-scale by designing tools that allow for organizations to foster their workforce through improved culture. Therefore, small-scaled companies to large organizations can all leverage this approach without investing practically unreasonable amounts of investments.

To develop the set of proactive engagement-based solutions, we must follow a strict experimental protocol shown in Figure 2. Specifically, we use the literature above to create a preliminary list of 'root-causes' to poor retention rates. Those precursors will be corroborated against the data collected and analyzed in this study in a manner that is validated in other academic domains and has not been used to understand truck driver shortage issue. Finally, the findings are used to create a standard that consistently predicts turnover likelihood better than random methods. The scope of this study is to develop the tools, and it is recommended that future studies be empirically validated across different settings.

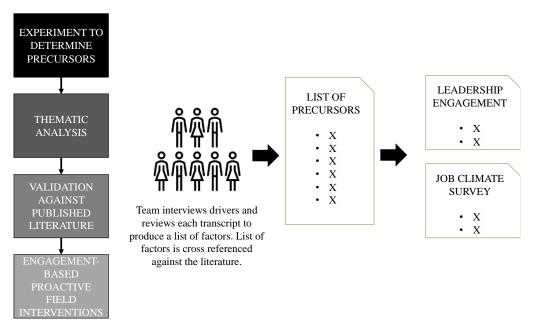


Figure 4: Overall Research Strategy

It boils down to a simple question: What warning signs can help the management recognize the best pathway to supporting drivers having an *unusually* negative experience at work?

DATA COLLECTION STRATEGY

In this study, 23 drivers were interviewed over the course of 3 months. Of the 23 drivers, 9 had less than 5 years of experience within the industry while the remaining 14 had 5 or more years of experience. Although studies have sampled drivers in the past, the researchers sought new data for numerous reasons. First, as mentioned before, the positivistic approach to studies in the past has been confirmatory and prone to introduce anchoring bias among participants being interviewed. Secondly, post-pandemic perspectives were being sought to supplement the learnings from previous studies and to bolster the ecological validity of the findings. Finally, drivers with varied levels of experiences were targeted to enhance the external validity of the findings proposed below. These validities equate to the scientific merit of the work performed here, wherein the data aims to be generalizable across the target populations (i.e., truck drivers) and to capture the complexities of the real-world.

In collaboration with the Michigan Truck Safety Commission (MTSC) and industry partners, we recruited drivers on a voluntary and uncompensated basis to participate in these interviews. The interviews are rooted in social constructionism approach to research that uses an interview-style with simple, open-ended questions designed to facilitate conversations without leading interviewees [Gibbs 2007]. The fluid and natural conversation approach of social constructionism allows for a better understanding of the world through patterns, contexts, and social interactions [Gergen and Gergen 2004]. While the survey data will provide useful findings, the discourse analysis will fill in the gaps to understand the reasons behind the survey data in a more robust way. A social constructionist approach reveals the complexities, consistencies and inconsistencies in the ways people speak about their jobs [Wetherreall and Potter 2004; Buruck 2005]. This approach was chosen so that interviews could be conducted without presumptions or biased points of view as noted above and displayed in previous studies. This was specifically accomplished by asking questions around what drivers liked and disliked about being a truck driver and the organization they work for. This approach counters the positivistic approach to data collection wherein researchers may seek to prove a phenomenon exists. That would be inappropriate for this study as the researchers did not have a null hypothesis that they were testing; rather they were collecting exploratory data that informs scientific perspective.

All interviewees were from Michigan and were interviewed online through Zoom or by telephone. No identifying information was asked, and cameras were turned off when interviews were conducted via Zoom. The interviews were then transcribed and used in the analyses. Table 1 shows the interview prompts to initiate the conversation and the interviewees adopted an open-conversation approach to obtain rich information through conversations.

Table 2: Interview Questions

EXPERIENCED DRIVERS	NEW DRIVERS
When did you first start working as a truck	Tell me a little about how you made the
driver?	decision to join the trucking industry?
Tell me a little bit about your typical day at work.	So, how is your experience so far? Tell me a little bit about working as a driver and working for your company name.

What has it been like working in the trucking industry?	Tell me a little bit about your typical day at work.
How has, if at all, your job changed over the years?	Has been more or less what you thought work would be? I mean, the lifestyle and the amount of work you have to do per week.
Has the industry changed over the years?	Who do you typically interact with in the company? What are interactions usually about?
What technological changes have you seen in the industry over the years?	Is it easy to have enjoyable social interactions at work?
So, given you have seen these changes, which of these have been positive? Any changes that have made your work more difficult?	What has been the most surprising thing about working as a truck driver for you?
How do you balance personal life while working as a truck driver?	If there is anything you would change about your work, what would it be?
Is it difficult to maintain physical health as a truck driver? What do you do to look after your health? How has this impacted your mental health?	If you had a do-over, going back to school and starting over, what would you have wanted to do and why? Think of anything you could have been and why?
The industry has been facing severe shortage of drivers. In your experience, what is causing this shortage?	How has your personal life been since joining this line of work?
In your experience why do new hires leave the industry?	How has your physical health been since joining this line of work?
If you were asked to speak to some young kids in school on why they should (or shouldn't) join the industry – what would you say to them?	What do you do to look after yourself – you know, mentally and physically?
Is there anything about the industry that has been on your mind that we have not talked about today?	Any technological advancement or changes in the industry you're excited about? Can you tell a little more on why you're excited about those changes?
-	Any changes you're not looking forward to? The industry has been facing severe shortage of drivers. In your experience, what is causing this shortage?
-	In your experience why are folks joining and quitting shortly thereafter? What should we change to improve this situation?
-	If you were asked to speak to some young kids in school on why they should (or shouldn't) join the industry – what would you say to them?
-	Is there anything about the industry that has been on your mind that we have not talked about today?

ANALYSIS AND RESULTS

The analysis method used in this study is labeled as thematic. Thematic analysis is one of the most commonly used techniques within qualitative research. It is the systematic process of finding patterns within language [Maguire and Delahunt 2017]. This study followed the 6-step process suggested by Braun and Clarke [2006] as shown in Figure 2. The data collected was transcribed and analyzed by two independent researchers. The codes were generated to break the transcripts into smaller chunks, and the chunks were organized within themes to determine if there was a pattern emerging. This process of coding is labeled as 'open-coding' (i.e., pre-determined codes) which was aligned with the exploratory nature of this study and improved the internal validity of the process by controlling for confounding effects resulting from researcher confirmatory bias. The themes identified were cross validated by the academic team members independently to ascertain if there was a sufficient pattern to detect a theme [Braun and Clarke 2006]. A number of themes noted below that have been previously identified in literature. However, some new notable contributions have not been highlighted in depth before. Regardless, all the themes identified have been detailed below in depth. Perspectives of both driver groups [experienced and new] have been presented separately whenever differing perspectives were shared. The results presented are not causal; rather they are associative and further empirical validation is needed to ascertain the predictive capacity of each theme as it relates to driver retention.

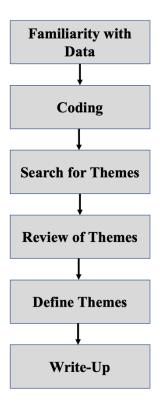


Figure 5: Thematic Analysis Process

Notable themes from the data include the following:

Social Connections and Mentorship Programs. The drivers from both groups reported their desire to connect more deeply with other members of the organization. However, they presented different perspectives which have been documented below.

- Inexperienced Drivers: Drivers relatively new to the industry find the lack of feedback and communication disconcerting. Given how social media allows users to receive instant feedback, and that schools and colleges provide constant interactions with professors and administrators the transition to workplace is a jarring experience for younger individuals [Reid and Weigle 2014]. While traditionally feedback is given on an annual/semi-annual basis or when some improvement is desired, engagement strategies around feedback needs to be envisioned. Providing positive reinforcement and/or constructive criticism reduces anxiety and uncertainty experienced in the workplace without Signiant investments.
- Experienced Drivers: Experienced drivers reported a high-level of job satisfaction when given opportunities to share their stories and collaborate with the management in engaging with the incoming workforce. On the other hand, societal perspectives on what it means to be a truck driver that is not an issue neither one company nor one study can resolve. These longstanding issues may be something the industry has to accept and adapt to. A way to do so is creating a strong community within the organization with peer-support [Repper and Carter 2011].

This study verifies both groups of drivers desire a community and feeling of belongingness. These findings align with results from all other research in occupational psychology concerning what employees demand from the workplace (e.g., Waller 2020).

Automation and Other Technological Advances. Contrary to publications within mainstream media, the drivers from both groups were extremely welcoming of newer technology such as Advanced Driver Assistance Systems (ADAS), partial automation features, and teleoperations (i.e. remote driving). For them, integration of this new technology not only represents a sense of pride in belonging to an industry that keeps with the changing dynamics of the world; it also equates to improved safety for themselves and other road users. Safety was not noted by every single participant interviewed in this study as a key positive factor to being in the trucking industry as compared to construction, mining, and other blue-collared jobs. However, a significant number of interviewees noted that safety is a key, and that automation technology is making roads and driving safer. There was a wide-spread understanding that the technology that would completely eliminate the need for a human operator for trucks was in the distant future (which is also the current consensus in the vehicle automation literature [Bansal and Kockelman 2017]) and as such the technological advances would reduce their fatigue, increase excitement of driving new vehicles, and improve reliability.

It is worth noting that the anticipated automation technology rollout for the trucking industry is largely focused on long-haul trucking. The first stage is to gradually incorporate more ADAS and automation features from now until the 2030s. Once the automation features are sufficient for the truck to drive autonomously 70-90% of the time, teleoperations will be used to operate the trucks during times when the automation features cannot work (no one is physically in the truck). It is

likely that truck teleoperators will continue to be needed to manage fleets of long-haul trucks for the foreseeable future, beyond the 2040s [McGrath 2021].

Family. The drivers from both groups reported the work-life balance as it related to time away from family. It is not surprising that long-haul drivers report this issue as a key reason for them leaving the industry [Apostolopoulos et al. 2014]. However, local route drivers also shared that leaders and management did not acknowledge how much the job took out of them physically and mentally, inhibiting them from having a work-life balance. Long hours, shortage-related overtime, and exhaustion were noted as the key reasons behind why younger drivers did not stick with the industry and why experienced drivers did not recommend the next generation (e.g., children) to join this industry. This issue is not an easy one to rectify for organizations because they cannot change the fundamental nature of the work in the short-term. Additionally, organizations cannot be involved in familial or personal problems of the employees on an individual-basis but there could be some community-based solutions that can be undertaken. Management should include drivers into conversations in finding creative solutions to alleviate the work stress and demands. Honest recruitment campaigns, orientations, and conversations will also help build more reasonable and practical expectations among younger/newer drivers who can reach out to veterans in the industry for advice.

Professional Development Opportunities. Both veterans of the industry and newcomers appreciated organizations that acknowledged their educational achievements. There was general feeling of indignity when the organization did not appreciate drivers' accomplishments in higher education and when businesses assume that they were not academically inclined. Drivers indicated a high-level of job satisfaction when companies fostered marketing, outreach, or training programs that suggested that drivers were vital to the mission of the organization.

Simple interventions such as starting mentorship programs where new drivers are paired with long-timers within the organization can be highly effective. This addresses not only the desires of the drivers to build a community, connect, and impart experiences but it also allows younger drivers to receive interactions and feedback from their mentors within the organization. Mentorship programs also fosters a strong culture of community within the organization. Additionally, involving drivers in some decision-making that shapes the organization empowers them to feel like stakeholders. Involving them in some management-related activities or soliciting ideas on improving any aspect of work can be highly empowering [Loizou and Charalambous 2017].

Physical and Mental Health. Unsurprisingly, the nature of work in this industry is not conducive to good physical and mental health. Drivers in general struggle to make sure they have the physical activity to keep themselves fit. There is immense fatigue and often drivers do not get a healthy outlet to stimulate. The lack of physical activity is not unique for trucking industry [Flint et al. 2017]. However, truck drivers are particularly challenged by the lack of access as they are on the road. Drivers also talked about the long hours and the isolation in their work as reasons for poor mental health. While organizations often do not have individuals who are trained or equipped to address mental health-related issues (e.g., chronic illness, diagnosed clinical conditions, disorders etc.), they can build better wellness through effective and proactive interventions.

A key aspect to combat poor physical and mental health noted by drivers was working on upgrading rest stops. It was noted that rest stops with gym services, eating facilities, and communal space not only promote drivers to take better care of their physical shape but also encourages engagement with other drivers, which reduces the feelings of isolation. Organizations and agencies may seek to build more awareness through education on how drivers can maintain their physical and mental health. Using technology to promote better eating, resting, and exercising habits on their routes can sustain the wellness of their employees.

Communication Barriers. Drivers mentioned that communicating with dispatchers is a challenge especially when there are language barriers. Although, drivers were unhappy that in many places a dispatcher was no longer needed due to technology as it eliminated human interactions in a job that already lacked it. However, having dispatchers who are ill-equipped to communicate properly increases frustration and fatigue in a job that is already physically and mentally taxing.

Job Demand.

Trucking is a thankless and taxing job more often than not. Drivers, like those in other industries that face shortfalls right now (namely construction and aviation) reported feeling overworked and stressed [Caraway 2020; Carter 2022]. Job demand may be an issue that leaders and management feel they have minimal control over. However, it is important to acknowledge that studies have repeatedly found excessive job demand is linked to poor employee productivity, morale, and job satisfaction. On a more private level, excessive job demand can lead to higher levels of depression and anxiety along with a higher tendency to engage in alcohol and substance abuse [Lee et al. 2022; Van der Doef and Maes 1999]. It is key to employee burnout and, therefore, management needs to find ways to intervene.

Organizational Culture. The drivers from both groups presented a shared perspective on wanting leaders to invest in the company culture. Businesses tend to focus on culture building exercises after establishing themselves. However, this approach is more costly because not only an organization need to ingrain an ethos within the existing workforce while combating inertia around practices that are already in-place. Culture is an important driver of employees' morale, commitment to succeed, absenteeism rate, performance, and engagement; it also determines an organization's reputation, and potential for sustainability [Awadh and Alyaha 2013]. Organizational culture has been found to be the strongest predictor of employee retention [Sheridan 2013].

Financial Security. Although, some drivers noted that the pay was very attractive, they mentioned struggling to meet their financial goals regardless.

• Inexperienced Drivers: Drivers reported that the inability to acquire the CMV license at 18 and having to wait for an additional 3 years was a financial burden for many. The process of acquiring the license, training, and navigating other bureaucratic burdens costs upwards of tens of thousands of dollars whereas industries like construction are very easy for individuals to enter and earn comparable amounts.

• Experienced Drivers: For older personnel, family-related concerns were at the forefront. They noted that a number of 'lucrative' incentive programs involve starting bonuses for which experienced drivers did not qualify. Additionally, while the pay has been steadily increasing, they noted that it is not enough to cover the financial costs of raising a family. The researchers are unable to bifurcate if this finding is confounded by the current economic climate in early 2022 where higher inflation, gas prices, and cost of living have influenced drivers' responses due to recency bias [Kilian and Zhou 2022].

Public Outreach and Improving Diversity. There is a broader need for improving the public image of the trucking industry. Drivers noted that the overall perception of their job and the industry they work for kept them from recommending it to the next generation. This also negatively impacts their social standing that prompts them to quit when offered another opportunity. Younger drivers noted that they wanted to make some quick money before leaving the industry for a more "respectable" job. This can change through targeted campaigning. Instead of only asking younger people to join with improved incentives, there needs to be more aggressive advertising done on a larger scale; it must show how the trucking industry is modernizing and embracing change to keep with the times. First, a more representative pool of drivers within the industry will encourage more women and minorities to join the industry. Secondly, stricter workplace policies on harassment, bullying, assault, and abuse will make the industry seem less 'wild west' and more welcoming. Finally, embracing newer technology (i.e. ADAS, partial automation features, teleoperations, etc.) and making an effort to explain how this supports the drivers rather than eliminating their position. will boost recruitment and retention.

Company Support Systems/Employee Assistance Programs (EAP). Employee assistance programs (EAP) are becoming common practice within organizations across the board [Kirk and Brown 2003; Sonnenstuhl and Trice 2018]. EAP services range from providing employees the opportunity to be more productive in their workplace to taking care of their personal well-being and professional development. A number of issues discussed above could be addressed by organizations through having a dedicated Human Resource (HR) division that would provide services to drivers. For example, EAP services would provide drivers with resources, including but not limited to, providing professional development opportunities, combating alcoholism and substance abuse alleviation, referrals, coaching services, and workplace conflict resolutions. EAP services have been shown to reduce absenteeism, workers' compensation claims, turnover, and safety violations. These services are now essential to any business, small or large, to demonstrate in earnest that the company cares about its employees and prioritizes their wellbeing.

In cases where trucking companies did have services, drivers in our study reported they were not informed about or aware of the resources being available to them. Especially, drivers entering the industry reported not having a rigorous orientation to learn what services were available to them. Moreover, experienced drivers felt their experience and knowledge were not leveraged to improve these services to better support the workforce and in turn, the organization itself.

This study's goal was to discover the *precursors* (or the warning signs) that would indicate that the employees have a negative outlook towards their job. These themes represent the **warning signs** that drivers may be struggling with one or more issues linked with higher turnover. Consequently, the challenge with a negative outlook is that different individuals can have different

outlooks at any given time. Then how can organizations respond in a manner to maximize their return on investment (i.e., keeping personnel that they hired, trained, and placed within the ethos of the company)? Additionally, when should the leaders intervene is a question that needs to be addressed? The precursor approach focuses on detecting these warning signs that have deviated from the norm (i.e., baseline). The next section provides recommendations and guidance on how to implement them.

RECOMMENDATIONS

Given this background, the investigators propose the following tools that can be used to improve the current issues and concerns with truck driver shortages.

Job Climate Survey

Included in the Appendix, this survey-style tool measures how drivers feel about the work, working environment, and the organization culture. This tool hinges on drivers trusting the organization that their responses will not be tracked back to them and influence their job standing. This is not a tool that is launched in isolation, and care must be taken to avoid any coercive responses. The following suggestions will assist any organization seeking to use this tool to learn how drivers feel about working in the respective organization:

- Paper-based responses should be avoided. Although cheaper on the front-end, the
 responses will be suspect because drivers are not likely to be critical when they are being
 observed and someone from management is collecting the surveys right in front of them.
 Electronic responses should be collected to promote honest responses. Leadership must
 reiterate that their responses are completely anonymous, and results will be aggregated to
 improve employee services.
- Data should be aggregated over multiple time stamps to avoid positive or negative kneejerk reactions. Multiple rounds of data collection will allow each organization to establish their individual baselines and measure against those baselines to determine when intervention/investments may be needed to reduce the likelihood of turnover.

Climate surveys are incredible and powerful tools to gauge a pulse, a snapshot in time on how the organization as a whole (i.e., leadership and management) is perceived by the employees delivering the services needed [O'Connor et al. 2011; McMurray et al. 2010; Colla et al. 2005]. Climate surveys serve as a proxy measure of organizational culture [Schneider et al. 2013]. By measuring organizational climate, leadership can gain a deeper understanding of the *shared perceptions* of the employees and respond to pain points in a targeted manner. The shared perceptions are the key here because it is not the measure of how one individual feels; rather it is an aggregation of how the organization's entire workforce as a community feels. Additionally, the perception of measuring climate, in turn, supports an improving environment because it reinforces the notion that the organization wants to listen and learn from the employees delivering the bottom line.

A word of caution for any organization using the survey is that they should not chase after a particular score on this survey. There is no validated threshold determined yet that is predictive of

higher likelihood of leaving the organization/industry. However, once there is enough data collected over time, any given management can monitor trends to note when there is a reason for concern or intervention and when the patterns are stable. The Job Climate Survey based on the findings from this study is available in the Appendix.

Leadership Engagement Guide and Observation Scorecard

Leaders are the catalyst for lasting change within any organization. Occupational scientists have established (through repeated studies in different industries, sectors, and environments) that the leaders of any organization can make or break employee engagement, performance, commitment, job satisfaction, and bottom-line earnings [Harter et al. 2002]. Businesses need their leaders to be donning different hats, responding to changing workforces, and communicating clear expectations. Even companies that have a "good" culture cannot rest on this notion, as culture is evolving and at mercy of employee perceptions. Leaders are at the forefront of not establishing culture but also consolidating it over time. Values need to be consistently communicated and at times, forcefully reinforced. Given the role leaders can play within any organization, this study has put together two deliverables to support management in their quest toward better organizational culture.

Leadership Engagement Guide: The guide is a supportive tool alongside a feedback post-engagement survey that can be used by leaders **before** partaking in any engagement. As noted above, effective leadership engagements communicate the values of the organization and help to establish a strong culture. To engage effectively, a leader must communicate clearly and demonstrate active listening skills. This guide supports leaders by providing suggestions for what to do during field leadership engagement with drivers. Interventions of this nature have shown their effectiveness in numerous industries and occupational settings such as healthcare, military, aviation, manufacturing, construction, technology, and any other corporate environment [Carasco et al. 2015; Frankel et al. 2006; Decuypere, and Schaufeli 2020].

Leadership Observation Scorecard: The leadership engagement feedback survey is designed to be completed by the leaders after completing the engagement with each driver. This tool is to support the leadership out doing the engagements to take note of the different precursors (i.e., warning signs) they observed during the conversation. This also is not a tool that should be used as a target score that needs to be achieved. This tool should not be used during the engagement to ensure the focus is on the conversation. Drivers should not feel that they are being evaluated or audited through the engagement. If not, the drivers will simply respond in automated fashion and just say whatever they perceive the leader/management wants to hear. This should not only come across but truly be believed as a tool being used by management to keep the process of continual improvement alive. Practice of such tools is common in corporate settings as well as educational environments.

Consequently, it is quite obvious that these tools cannot be used on a daily or weekly basis with each and every driver, nor do they need to be used so frequently. These tools are for the leaders to have an ear to the ground and understand where their attention is most needed. Additionally, by creating benchmarks over a few quarters, the trends shown through these tools could be monitored and measured. More research is needed to validate how these frameworks need to be applied and if there are certain thresholds over which precursors are predictive of higher likelihood of turnover.

Recommendations for a Multimedia Recruitment and Retention Program Design

The most effective strategy for any multimedia program around improving recruitment and retention should not only leverage the knowledge and experience of drivers, but it must also put them front and center. This approach has two big advantages. First, it will make the next generation hear from people in the industry doing the work. For example, TikTok's popularity has reinforced that people deeply care about learning from other people's experiences [Literat 2021]. Secondly, perhaps more importantly, it addresses the existing workforce's biggest complaint of not being involved in professional development and management practices. These approaches can reduce isolation experienced during work, increase pride, and initiate self-reinforcement among drivers about why they are in this profession to begin with. This work needs more research to discover how drivers can be incorporated into the hiring lifecycle and this study recommends it as the next step. Furthermore, the multi-media program must also focus on providing leadership training to develop the necessary skill for managers to effectively communicate the values of the organization and to connect better with truck drivers to establish a strong and friendly work environment and culture for drivers to thrive. The tools mentioned above (i.e. Job Climate Survey, Leadership Observation Scorecard, and Leadership Engagement Guide) must be part of the leadership training lesson plan.

Other Notable Recommendations

- This study had originally proposed interviewing school counsellors and understanding their biases in recommending the trucking sector as a career path to students. While the investigators did interview 10 counsellors, the sample size was too small to draw meaningful conclusions from it. The reluctance of schools to participate in this study became a lesson in hindsight to include an incentive program budget within future proposals that could encourage researchers to get access to data. However, as shown in the findings above, it is clear that the answer for recruitment lies within the protagonists of this story: drivers.
- Drivers noted that the qualifying age of 21 years makes many youngsters opt for an industry that is easier to enter such as healthcare, construction, etc. Therefore, creating apprenticeship programs that can attract younger drivers is highly recommended. Such programs may need to pay competitive stipends to incentivize participation. Additionally, key trucking industry stakeholders may want to work on changing the licensing requirements and regulations for truck driving licensure so that drivers can enter the industry earlier than 21, perhaps by linking earlier licensing to apprenticeship programs.
- Technology that makes driving safer and exciting is welcomed by drivers across the experience spectrum. There was no fear from a technology that would completely eliminate the need for a human operator for trucks. Consequently, investing in technological advances is highly recommended and has been reported by truck drivers as possibly contributing to the reduction in drivers' fatigue, the increase in the excitement of driving new vehicles, and the improvement in reliability.
- Drivers noted that the presence of Employee Assistance Programs was necessary and should be prioritized within companies. This issue may become a necessary additional benefit that is added to the employment packages offered to new truck drivers.

SUMMARY AND CONCLUSIONS

To recap, this study sought to discover the positive and negative factors of working in the trucking industry. This was a novel research approach unlike many other studies that simply focus on negative factors and fall prey to the confirmatory bias. Through exploratory research methods, the findings represented in this report highlight the importance of understanding how certain macro (i.e., industry-wide, national, or global) problems can be addressed through standardized microsolutions. The standardization comes from using scientific evidence to ground solutions. Most importantly, the proposed solutions are tailored to fit the different contexts to promote adoption, implementation, and corrections. The precursor-based approach is a forward-looking method to encourage structured, planned, and meaningful engagements among drivers and leaders. It also shows how those engagements can lead to enlightening management while improving the morale of drivers in real-time. More research questions still need to be explored to directly support practitioners in fostering and bolstering the long-term sustainability of this industry. Our hope is that this research provides avenues for future discovery and learning.

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DISCLAIMER

The opinions, findings, and conclusions expressed in this publication are those of the author(s) and not necessarily those of the Michigan Truck Safety Commission or the Michigan Office of Highway Safety Planning. This report was prepared in cooperation with the Michigan Office of Highway Safety Planning and Michigan Truck Safety Commission.

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Appendix

- JOB CLIMATE SURVEY
- LEADERSHIP ENGAGEMENT GUIDE
- LEADERSHIP OBSERVATION SCORECARD

JOB CLIMATE SURVEY

We are committed to providing a healthy, safe, and secure working environment to all. These surveys are completely anonymous, and we would like to hear your honest opinion. We will aggregate all the feedback to find ways to support you better.

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FEEDBACK SURVEY	YES/NO
I am having more than typical (unusual) safety concerns on job.	
I am experiencing unusually disconnected and lonely.	
I am experiencing significant personal problems because of this job.	
I am struggling with physical health because of this job.	
I feel like I could be fired from this job at any time.	
I am sure that financially my family and I would not be secure with the current pay.	
I don't get to discuss my experiences at work with like-minded people.	
My ideas on improving the company, management, or the job are not taken seriously.	
The technological changes are not coming fast enough to make job safer and comfortable.	
I am not getting opportunity to provide/receive guidance to/from other drivers in the industry.	
I am not valued in this company by the leadership, management, or drivers.	
I am dissatisfied with not getting any opportunity to utilize my education in this job.	
I want but I am not given opportunities to grow in this job.	
The company provides no resources to support my mental health.	
The company provides no resources on how we can maintain good work-life balance.	
I am not sure who I can contact to share my concerns with any aspect of the job when I want to.	

LEADERSHIP ENGAGEMENT GUIDE

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The purpose of being prepared is to earn trust of your employees and establish a culture where upper management is working to support the employees.

BE PREPARED	GUIDANCE
A leader must dress appropriately.	 Avoid wearing an attire that creates a distance between you and the driver you're engaging with. Consider what your driver would typically wear and how you can reduce perceptions of power distance through physical appearance when conducting an engagement. Perceptions Matter!
A leader must appear to be part of the team.	 Learn and use names of the driver(s) you're talking to during the engagement. Learn something personal about their life. Share about your life and experiences that make you relatable to them.
A leader must state the purpose of the engagement.	 State very clearly why you are wanting to engage with the employee. State that you hope to learn from them how the company can better support them.

The purpose of being present is ensure you demonstrate care because it is not only important that you care about your employees but also, your employees must perceive you as a caring leader as well.

BEING PRESENT	GUIDANCE
Having a positive body language.	 Use active listening cues and a relaxed body language to establish this is a conversation, not an interrogation. Have the engagement in a non-confrontational environmental.
Listen, ask, and Repeat.	 Ask open-ended questions. Listen without constantly interjecting with counterpoints. Summarize what you heard from your employees back to them.
Demonstrate willingness to learn and understand.	 Ask meaningful follow-up questions that demonstrate a desire to learn. Treat this opportunity to engage and have a conversation and perform a job evaluation or audit.
Prioritize the engagement.	 Do not be distracted or multitasking during the engagement. Acknowledge and appreciate that the employee is taking the time to speak with you as well.

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The purpose of being compassionate is to understand what drives your workforce and how you can promote positive attributes of work, enhance the corporate culture, and engage the entire workforce to support the company in turn.

BEING COMPASSIONATE	GUIDANCE
Motivating Factors	 Ask what motivated them to get into this business. Ask what the best part about their work is. Ask what the worst part of working in the trucking industry is.
Acknowledgement and Providing Validation	 Acknowledge the effort and sacrifice they are making Acknowledge how the driver is individually contributing to the mission of the company. Acknowledge through examples taken from the experiences they shared with you how they represent the values of the company.
Sharing experiences	 Exchange personal positive stories without displaying your potentially higher socioeconomic standing compared to theirs. You must empathize with care by either sharing similar personal negative experiences to demonstrate you understand how they are feeling or acknowledging that you have been placed in such situations and you admire their grit and determination. You must not trivialize their personal struggles and disrespect their intellect by providing generic solutions.

The purpose of being prepared is to earn trust of your employees and establish a culture where upper management is working to support the employees.

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BE A LEADER	GUIDANCE
Health and Safety	 Recognize the importance of health and safety and what the company believes its role is in promoting a better working environment for everyone. Reiterate your expectations on safety practices during the engagement. Share/reiterate the initiatives the company is taking to promote health.
Empowerment	 Ask for ideas on improving the health and safety in workplace. Ask for ideas on improving the community and belongingness between all employees of the company. Ask for ideas on supporting experienced and newer drivers.
Accountability	 Provide clear communication on how you intend to use their engagement. Provide a point of contact for drivers to be able to reach out to you. Provide a point of contact for drivers to share ideas, concerns, and suggestions for future.

LEADERSHIP OBSERVATION SCORECARD

This scorecard is intended to be completed by the leader after they have finished a leadership engagement. A higher score indicates the driver has a more positive outlook towards the job.

	LEADERSHIP OBSERVATION SCORECARD	IF TRUE = 1 IF FALSE = 0
S	Driver reported satisfactory personal and social connectivity.	
ERN	Driver reported satisfaction with safety.	
CONCERNS	Driver reported satisfaction with physical and mental health.	
O	Driver reported high job security and control.	
IES	Driver shared experiences through stories.	
TUNITE	Driver shared ideas on improving communications with management, clients, and brokers.	
OPPORTUNITIES	Driver shared ideas to improve productivity, environment, and job satisfaction.	
NG	Driver understood how technology will be integrated to improve their job.	
UNDERSTANDING	Driver understood how to receive or provide mentorship/guidance from other drivers in the company.	
ERST	Driver understood how much the company and the upper management value them.	
[QND]	Driver understood how the company is providing opportunities for professional growth.	
	Driver was aware of the resources provided to support their well-being.	
CARE	Driver was aware on how to maintain a healthy lifestyle.	
	Driver was aware of the channels to share their struggles with the job demand and environment.	